Claim 40 was rejected under 35 U.S.C. §112 as containing subject matter which was not properly enabled. Claim 40 has been canceled, so this basis for rejection is considered moot.

Claims 1-2, 4, 8-10, 14-15, 19-20, 35 and 38-39 were rejected under 35 USC §103(a) as being unpatentable over Liu in view of Guiles ('658). This basis for rejection is respectfully traversed.

Independent claims 1, 7, 24, 31, 35-36 and 38 have been amended to clarify that the drive member is not used to couple sprockets to the crank arm. Liu discloses a crank arm (12) with a through opening (21) and an inside gearing member (20) with positioning lugs (25) that are used to couple a transmission gear (30) to a crank arm (10). The examiner refers to inside gearing member (20) as being a drive member. However, the very purpose of such a structure in Liu is to couple a sprocket to the crank arm. Thus, Liu actually teaches away from the presently claimed invention.

Claim 31 was rejected under 35 U.S.C. §103(a) as being unpatentable over Liu in view of Guiles and Yamanaka ('072). It is respectfully submitted that claim 31 is patentable for the same reasons noted above.

Claims 32 and 36 were rejected under 35 U.S.C. §103(a) as being unpatentable over Liu in view of Guiles. It is respectfully submitted that claims 32 and 36 are patentable for the same reasons noted above. Furthermore, there is no requirement in 35 U.S.C. §103(a) that a claimed structure solve any particular problem or be directed to any particular purpose. It is sufficient that the structure be useful and nonobvious. Any alleged precedent to the contrary could result in the denial of patents for completely nonobvious structures. In any event, the 20° requirement would help to ensure that the drive member could actually engage a coupling member in the assist mechanism.

Claims 21-23 were rejected under 35 U.S.C. §103(a) as being unpatentable over Liu in view of Guiles and Browning. It is respectfully submitted that claims 21-23 are patentable for the same reasons noted above. Furthermore, the examiner states that Browning uses four mounting arms, a large diameter sprocket and a small diameter sprocket in order to make the system easy to operate and to increase the ease during replacement of sprockets. However, Browning is silent about why

that particular configuration is used, so there is no evidence to support such a motivation to combine teachings of Browning with Liu and Guiles.

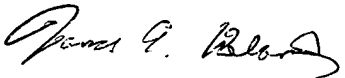
Claims 24-25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Liu in view of Guiles and Hsu. It is respectfully submitted that claims 24-25 are patentable for the same reasons noted above for claim 1.

Claim 7 was rejected under 35 U.S.C. §103(a) as being unpatentable over Guiles in view of Yang (US 5,083,991). This basis for rejection is respectfully traversed.

The examiner states that Yang discloses a drive ring (161) that includes a plurality of splines that engage a plurality of splines in a crank arm (10), and that the motivation to apply splines to the Guiles device is to allow the ring and the crank arm to rotate in unison and to allow for easy dismantling and assembling without the use of tools. However, the Guiles device already has a ring that rotates in unison with the crank arm, and it does not appear that Yang's ring can be assembled without tools. Thus, there is really no motivation to combine the teachings of Yang with Guiles.

Accordingly, it is believed that the rejections under 35 USC §103 and §112 have been overcome by the foregoing amendments and remarks, and it is submitted that the claims are in condition for allowance. Reconsideration of this application is respectfully requested. Allowance of all claims is earnestly solicited.

Respectfully submitted,



James A. Deland
Reg. No. 31,242

DELAND LAW OFFICE
P.O. Box 69
Klamath River, California 96050
(530) 465-2430

VERSION OF AMENDMENTS WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Claims 1, 7, 8, 24, 31, 35, 36 and 38 have been amended as follows:

1. (Twice Amended) A drive mechanism for a bicycle transmission assist mechanism comprising:

a crank arm having a crank axle mounting hole around a rotational axis; [and]

a drive member supported coaxial with the rotational axis and including:

a first abutment facing a forward rotational direction of the crank arm; and

a [non-concave] first sloped surface extending from a radially outer portion of the abutment and facing a rearward rotational direction of the crank arm; and

wherein the drive member is not used to couple sprockets to the crank arm.

7. (Twice Amended) A drive mechanism for a bicycle transmission assist mechanism comprising:

a crank arm having a rotational axis; [and]

a drive member [comprises] comprising an annular drive ring mounted around the rotational axis and including:

a first abutment facing a forward rotational direction of the crank arm; and

a [non-concave] first sloped surface extending from a radially outer portion of the abutment and facing a rearward rotational direction of the crank arm; [and]

wherein an inner peripheral surface of the drive ring includes a plurality of drive ring splines, and wherein an outer peripheral surface of the crank arm includes a plurality of crank arm splines that engage the plurality of drive ring splines; and

wherein the drive member is not used to couple sprockets to the crank arm.

8. (Amended) The drive mechanism according to claim 1 wherein the drive member includes:

a second abutment facing the forward rotational direction of the crank arm; and

a [non-concave] second sloped surface facing the rearward rotational direction of the crank arm.

24. (Twice Amended) A drive mechanism for a bicycle transmission assist mechanism comprising:

a crank arm having a rotational axis;

wherein the crank arm includes a sprocket mounting member for mounting a sprocket to the crank arm;

a large diameter sprocket retained to the sprocket mounting member;

a small diameter sprocket retained to the sprocket mounting member; [and]

a drive member including:

[a first] an abutment facing a forward rotational direction of the crank arm; and

a [non-concave first] sloped surface extending from a radially outer portion of the abutment and facing a rearward rotational direction of the crank arm;

wherein the large diameter sprocket includes a shift assist mechanism for assisting travel of a chain between the small diameter sprocket and the large diameter sprocket; and

wherein the drive member is not used to couple either the large diameter sprocket or the small diameter sprocket to the crank arm.

31. (Twice Amended) A drive mechanism for a bicycle transmission assist mechanism comprising:

a crank arm having a rotational axis; [and]

a drive member including:

[a first] an abutment facing a forward rotational direction of the crank arm; and

a [non-concave first] sloped surface extending from a radially outer portion of the abutment and facing a rearward rotational direction of the crank arm;

wherein the drive member is not used to couple sprockets to the crank arm;

wherein the crank arm has a crank axle mounting hole, and further comprising a plurality of splines disposed in the crank axle mounting hole.

35. (Twice Amended) A drive mechanism for a bicycle transmission assist mechanism comprising:

a bicycle crank arm having a crank axle mounting boss including a crank axle mounting hole and a rotational axis; [and]

only two abutments disposed on an outer surface of the crank axle mounting boss and facing a forward rotational direction of the crank arm;

wherein the two abutments rotate coaxially around the rotational axis; and

wherein the two abutments are not used to couple sprockets to the crank arm.

36. (Twice Amended) A drive mechanism for a bicycle transmission assist mechanism comprising:

a bicycle crank arm having a crank axle mounting boss including a crank axle mounting hole and a rotational axis; [and]

a drive member disposed at the crank axle mounting boss and including:

an outer peripheral surface;

wherein an abutment is disposed on the outer peripheral surface and faces a forward rotational direction of the crank arm;

wherein the abutment rotates around the rotational axis at a substantially constant radius; and

wherein the outer peripheral surface at a location of intersection with a radially inner portion of the abutment extends convex for at least 20°; and

wherein the drive member is not used to couple sprockets to the crank arm

38. (Amended) A drive mechanism for a bicycle transmission assist mechanism comprising:

a crank arm having a rotational axis; [and]

a drive member nonrotatably fixed to the crank arm including:

[a first] an abutment facing a forward rotational direction of the crank arm;

wherein the abutment rotates around the rotational axis at a substantially constant radius; and

a [non-concave first] sloped surface extending from a radially outer portion of the abutment and facing a rearward rotational direction of the crank arm; and

wherein the drive member is not used to couple sprockets to the crank arm.

Claim 40 has been canceled.